WHAT IS CLAIMED IS:

1. An interface between a driving member and a driven member, the interface comprising:

a driving member having a polygonal length, said polygonal length having at least one surface selected from the group consisting of concave, convex and straight surfaces; and

a driven member having a matching polygonal length,

wherein a portion of one of the polygonal lengths is twisted along an axis of the length.

2. The interface of Claim 1 wherein the twist is from about 0° 10' to about 1°.

3. The interface of Claim 1 wherein the driven member comprises a shaft having a male polygonal length.

4. The interface of Claim 1, further comprising a second twist along the axis of the length, said second twist in a direction opposite the twisted portion.

5. The interface of Claim 1 wherein the driven member comprises a shaft having a male polygonal length with at least one portion of the length twisted from about 0° 20' to about 0° 50'.

6. The interface of Claim 1 wherein one of the driving member and the driven member is straight.

7. The interface of Claim 1 wherein the polygonal length has a relative eccentricity of from about 1.5% to about 4%.

8. The interface of Claim 1 wherein the driven member comprises a shaft having a concave male polygonal length with a number of sides selected from the group consisting of 3 to 12.

9. A method of interfacing a driving member with a driven member, the method comprising:

providing a driving member having a polygonal length and a driven member with a matching polygonal length, wherein one of the driving member and the driven member has at least one portion of the length twisted from about 0° 10' to about 1° along an axis of the length; and

joining the driving member with the driven member.

10. The method of Claim 9 wherein the driven member comprises a shaft and the driven member comprises a flange.

11. The method of Claim 9 wherein the driven member comprises a shaft having a male polygonal length.

12. The method of Claim 9 wherein the driven member comprises a shaft having a male polygonal length with at least one portion of the length twisted from about 0° 20' to about 0° 50'.

13. The method of Claim 9 wherein the driving member and the driven member comprise one of a group consisting of a compressor, a pump, a machine tool, a mechanical drive, a generator, and a motor.

14. A coupling for an automotive drive shaft, the coupling comprising:

a shaft having a polygonal length, said polygonal length selected from the group consisting of concave, convex and straight surfaces; and

a mounting device having a matching polygonal length, wherein one of the mounting device and the shaft has at least one portion of the polygonal length twisted from about 0° 10' to about 1°.

15. The coupling of Claim 14 wherein the mounting device comprises a flange.

16. The coupling of Claim 14 wherein the driven member comprises a male polygonal length with at least a portion of the length twisted from about 0° 20' to about 0° 50'.

17. The coupling of Claim 14 wherein the polygonal length has a relative eccentricity of from about 1.5% to about 4%.

18. The coupling of Claim 14, wherein one of the shaft and the mounting device are straight.

19. The coupling of Claim 14 wherein the driven member is a shaft having a concave male polygonal length with a number of sides selected from the group consisting of 3 to 12.

20. A coupling for transmitting rotational energy from a driving member to a driven member, the coupling comprising:

a driving member having a polygonal length; and

a driven member having a matching polygonal length, wherein at least a portion of one of the members has a twist of from about 0° 10' to about 1°.

21. The coupling of Claim 20 wherein the driving member is selected from the group consisting of an axle, a half axle and shaft.

22. The coupling of Claim 20 wherein the driven member has a male polygonal length including a twist from about 0° 20' to about 0° 50'.

23. The coupling of Claim 20 wherein the polygonal length has a relative eccentricity of from about 1.5% to about 4%.

24. The coupling of Claim 20 wherein the driven member is a shaft having a concave male polygonal length with a number of sides selected from the group consisting of 3 to 12.

25. The coupling of Claim 20 wherein one of the members is straight.

26. A method of manufacturing an axle pinion gear, the method comprising:

furnishing a forging;

rough machining the forging;

hobbing a gear at a first end of the shaft;

heat-treating the shaft; and

hardturning at least two journals and a polygonal length on the shaft, wherein the shaft is not ground and the concentricity between the journals and the polygonal length is at least .001 inches (0.0254 mm).

27. The method of Claim 26 wherein the polygonal length manufacturing by hard turning has a portion twisted from about 0° 10' to about 1°.

28. The method of Claim 26 further comprising rollforming threads on a second end of the shaft before the step of heat-treating.

29. The method of Claim 26 wherein components of the polygonal interface are hardturned to a relative eccentricity of from about 1.5% to about 4%.

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Patent Pending